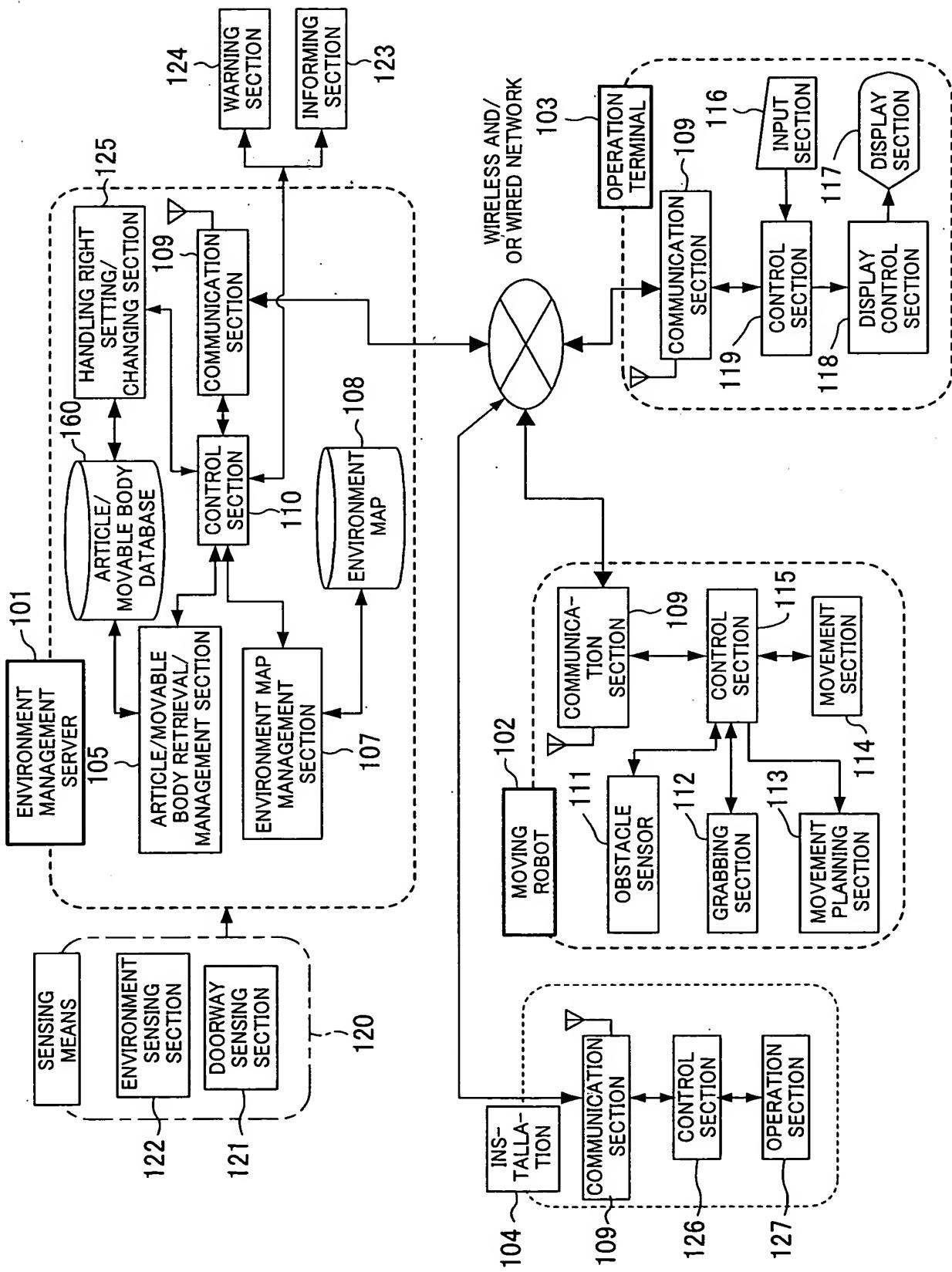
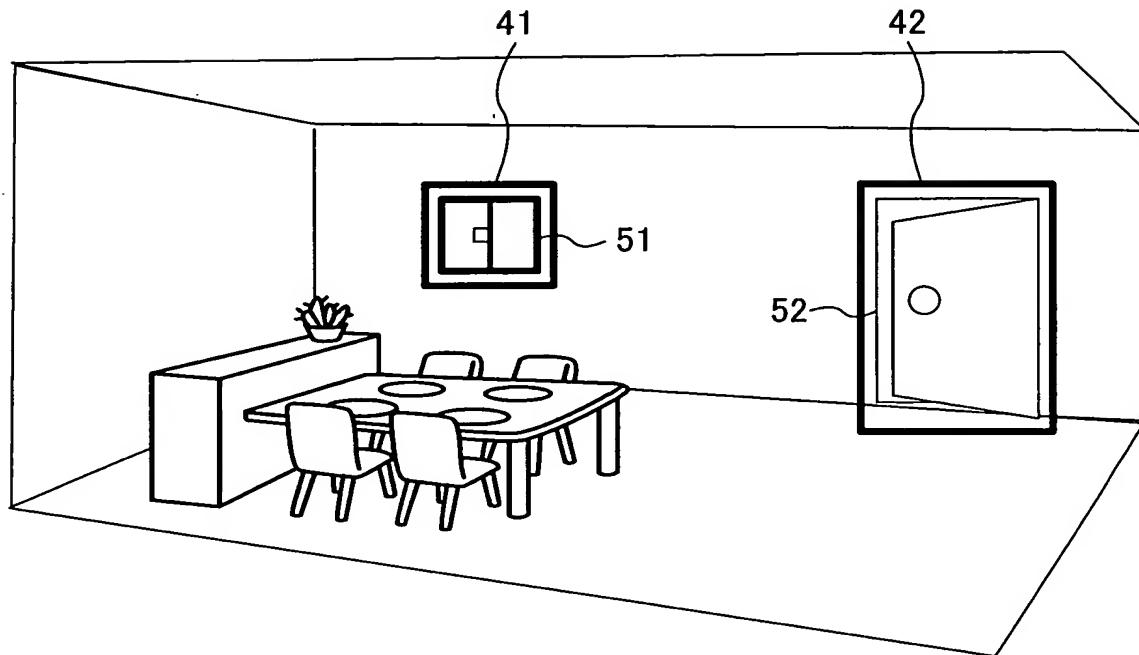


FIG.1



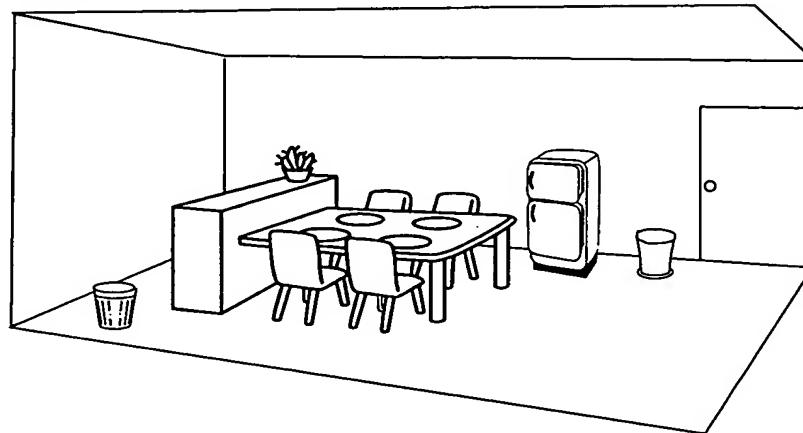
2/16

FIG.2

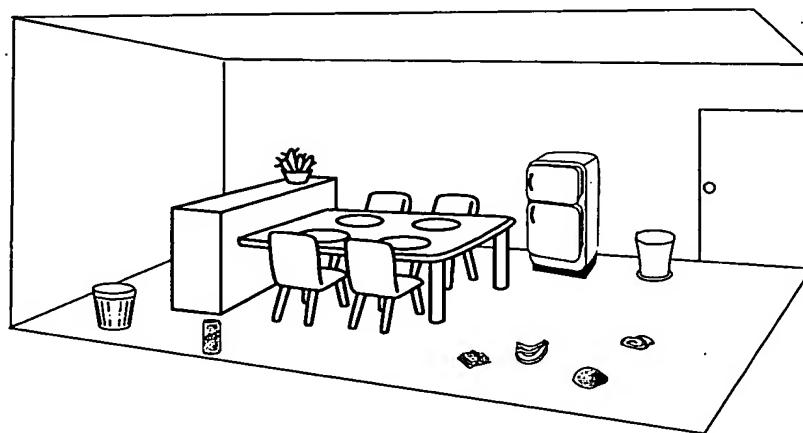


3/16

**FIG.3A**  
REFERENCE IMAGE



**FIG.3B**  
CAMERA IMAGE



BACKGROUND  
DIFFERENTIAL IMAGE

**FIG.3C**

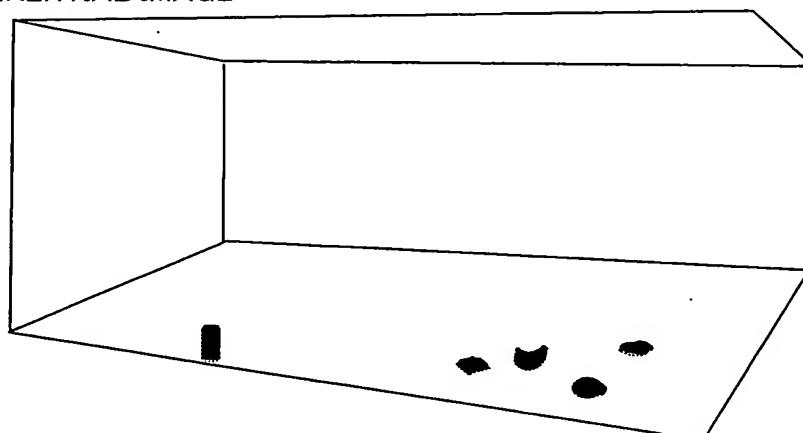
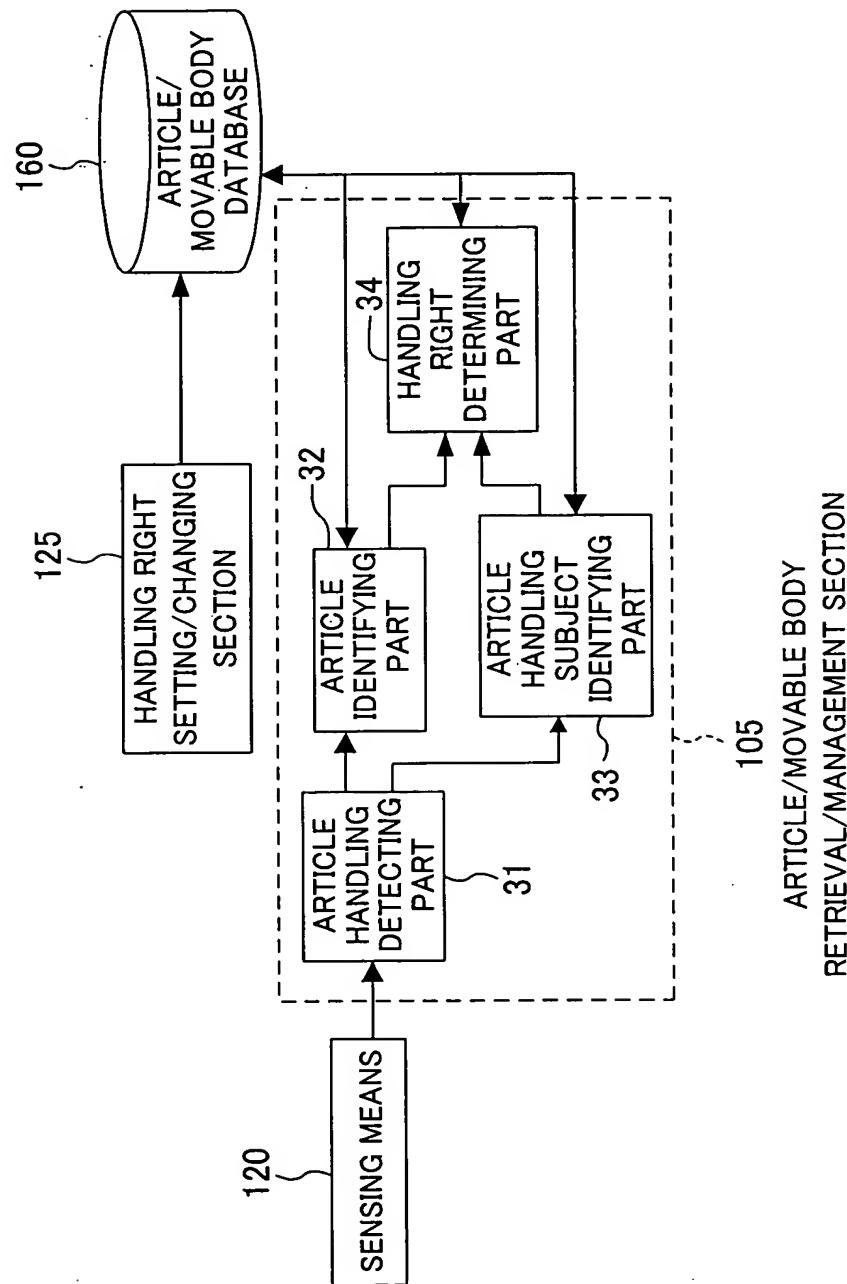


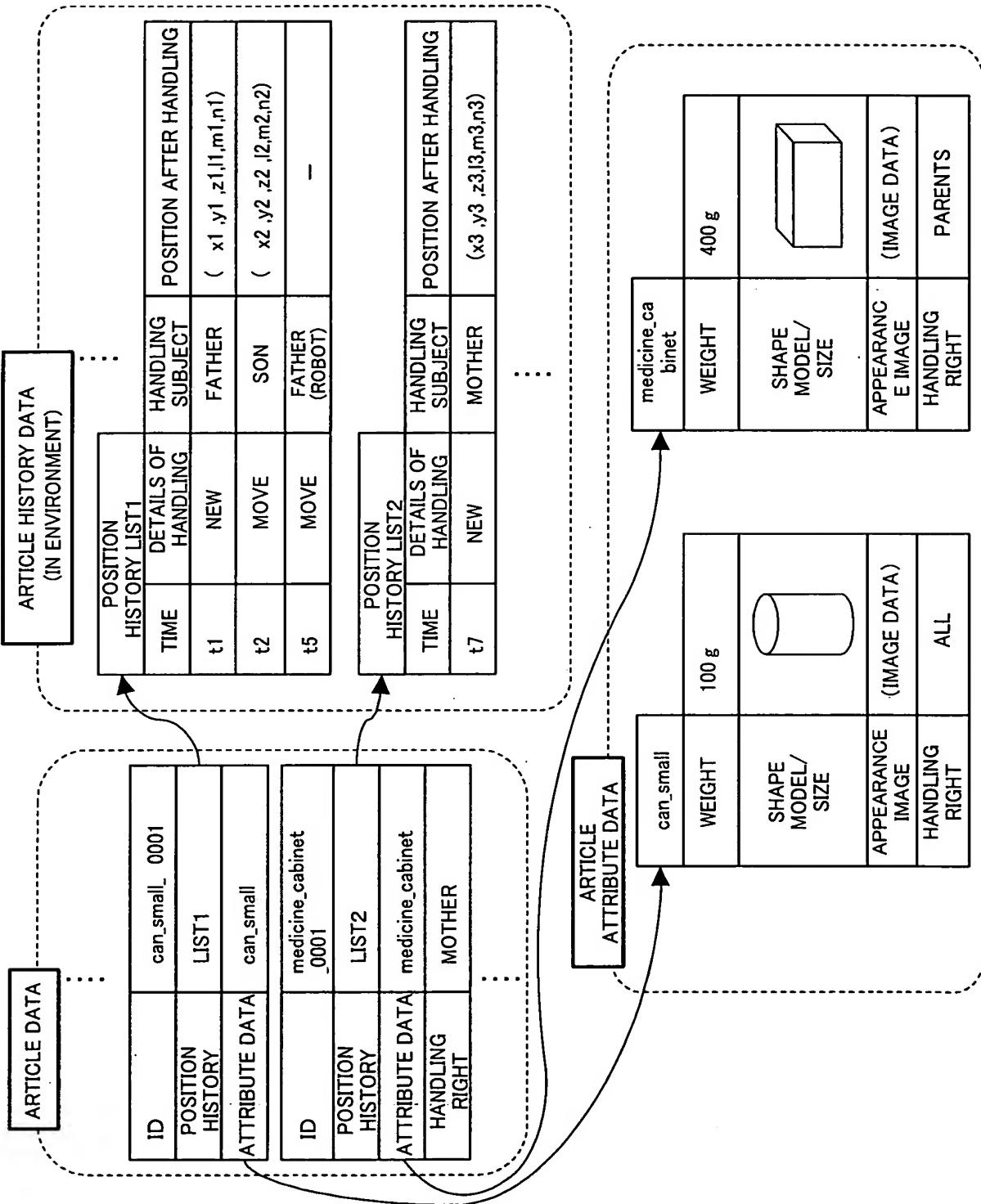
FIG.4



5/16

FIG.5

161



6/16

FIG.6

162

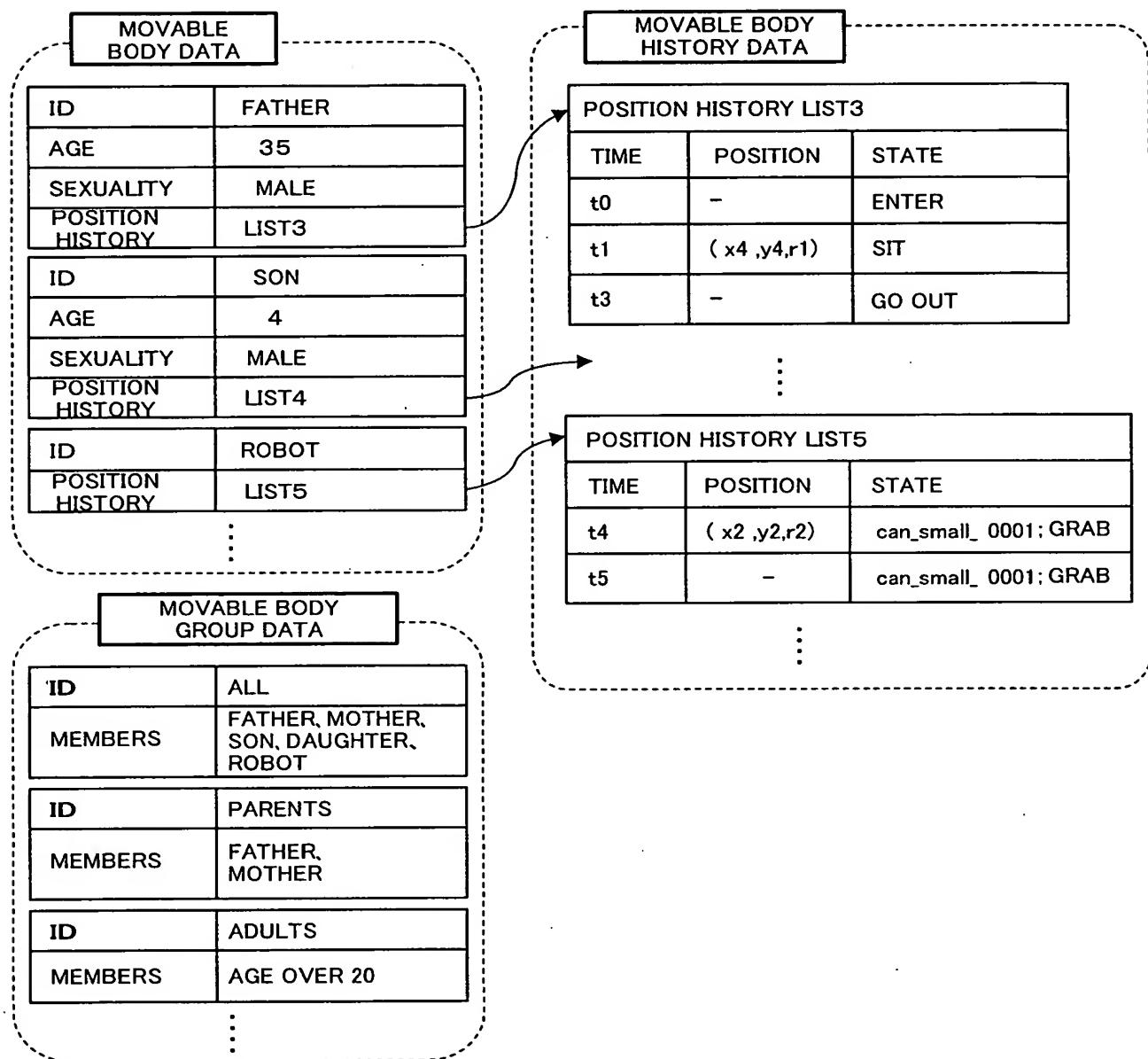
ARTICLE HISTORY DATA (AT DOORWAY)

POSITION: DOOR				
TIME	ARTICLE	DETAILS OF HANDLING	HANDLING SUBJECT	EVENT
:	:	:	:	
t0	Can_Small_0001	BRING IN	FATHER	
t5	Can_Small_0001	TAKE OUT	FATHER (ROBOT)	
t6	medicine_cabinet_0001	BRING IN	MOTHER	
t8	BAG A	BRING IN	MOTHER	
t9	BAG C	TAKE OUT	FATHER	BUSINESS TRIP
t9	CLOTHES A@BAG C	TAKE OUT	FATHER	BUSINESS TRIP
t9	TOWEL C@BAG C	TAKE OUT	FATHER	BUSINESS TRIP
t9	UMBRELLA B@BAG C	TAKE OUT	FATHER	BUSINESS TRIP
:	:	:	:	

7/16

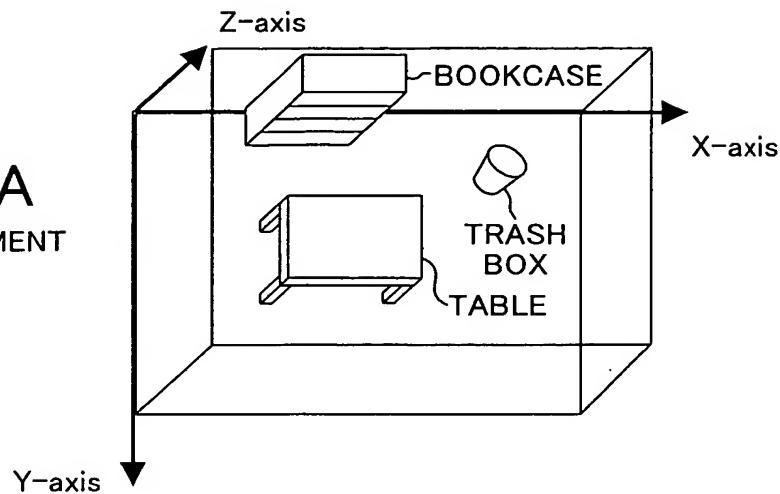
FIG.7

163

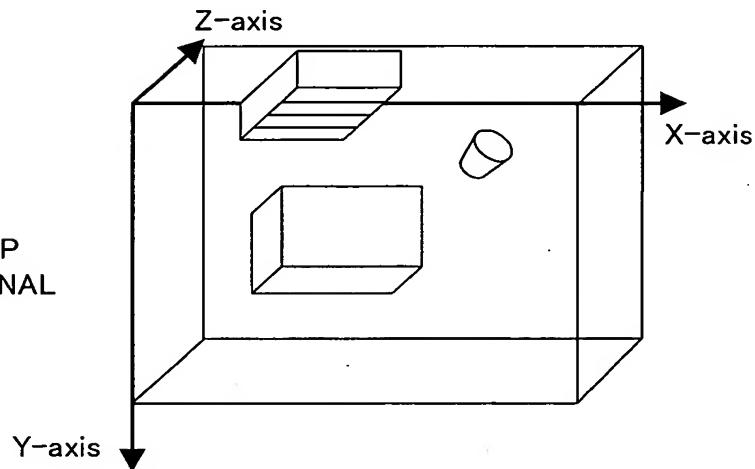


8/16

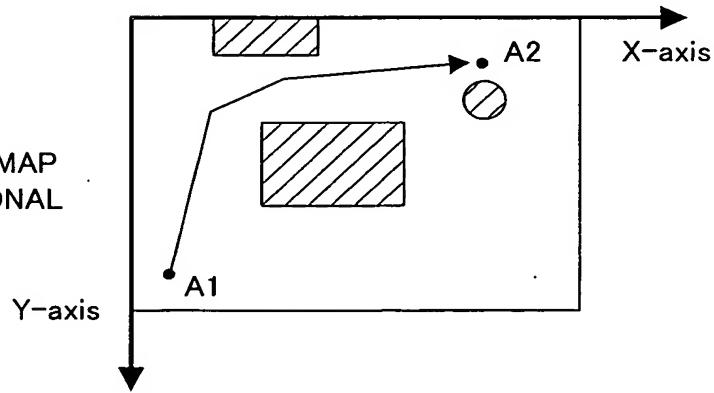
**FIG.8A**  
ACTUAL ENVIRONMENT



**FIG.8B**  
ENVIRONMENT MAP  
(THREE-DIMENSIONAL  
MODELS)



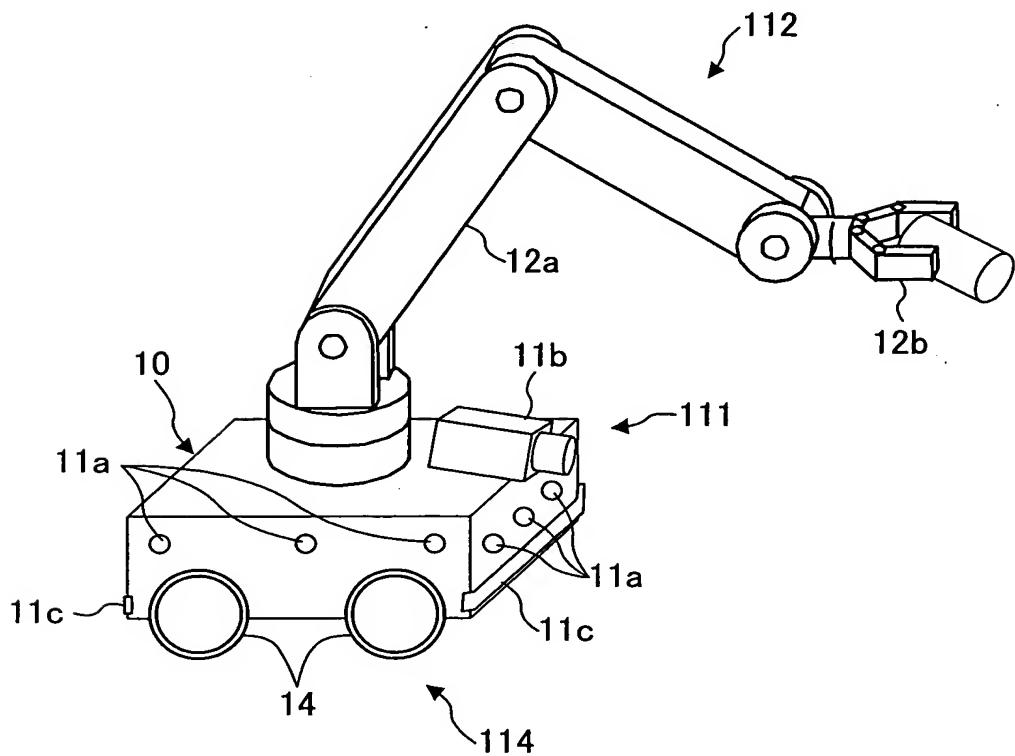
**FIG.8C**  
ENVIRONMENT MAP  
(TWO-DIMENSIONAL  
MODELS)



9/16

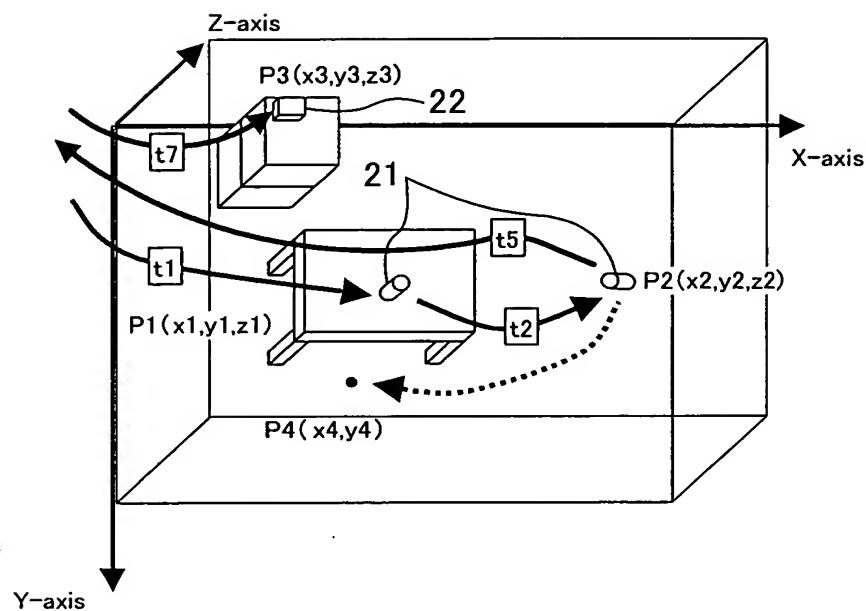
FIG.9

102



10/16

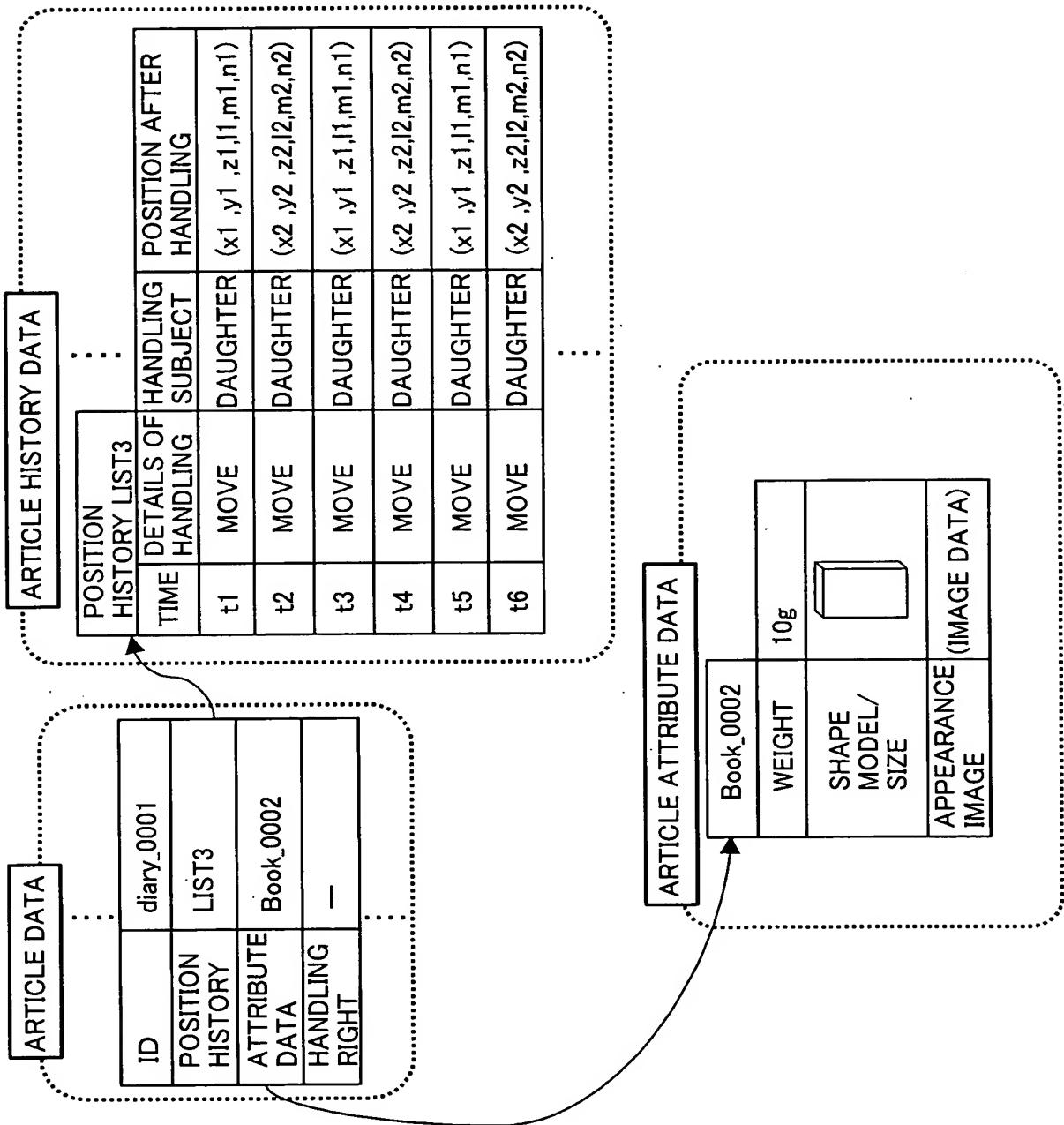
FIG.10



11/16

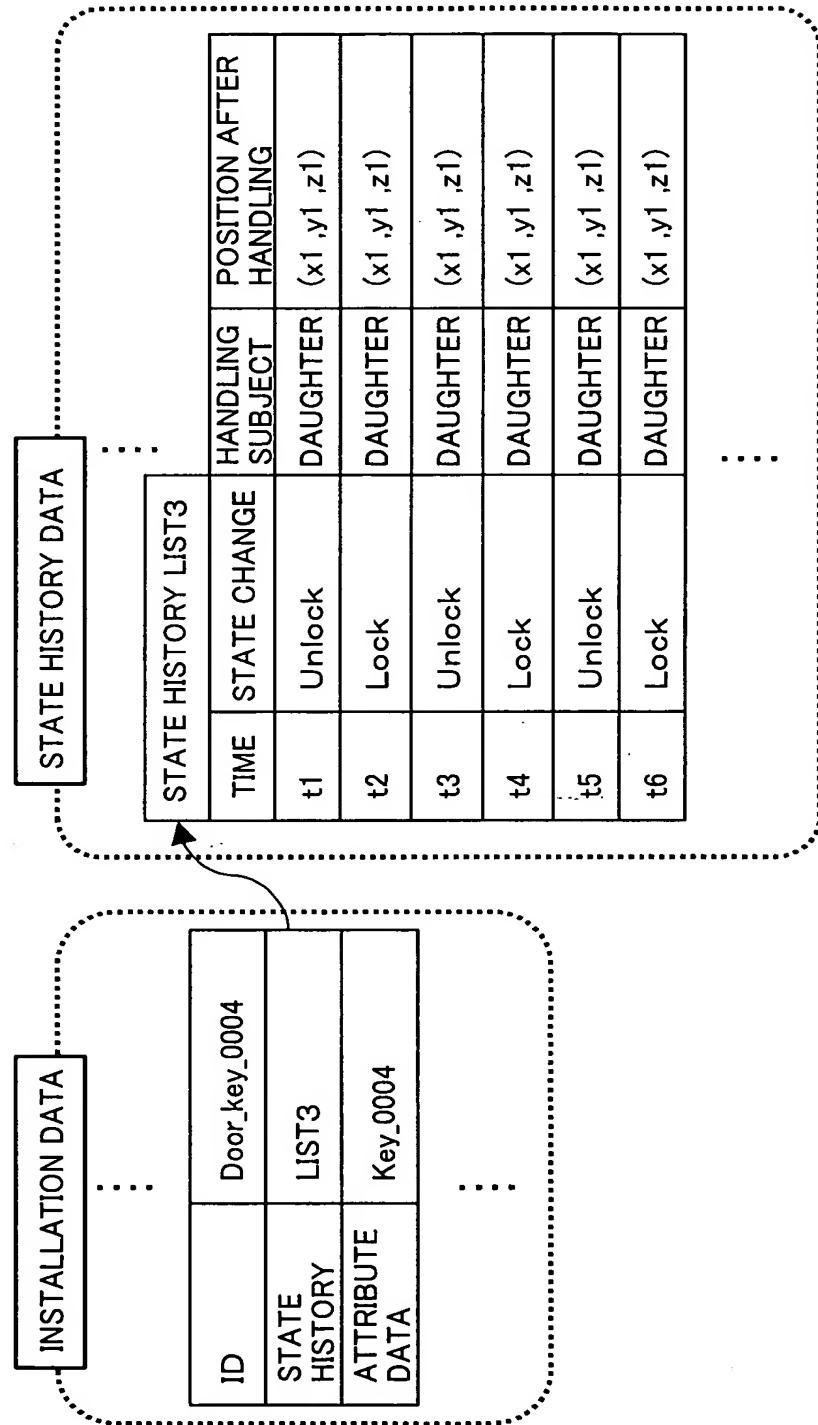
FIG. 11

161



12/16

FIG.12



13/16

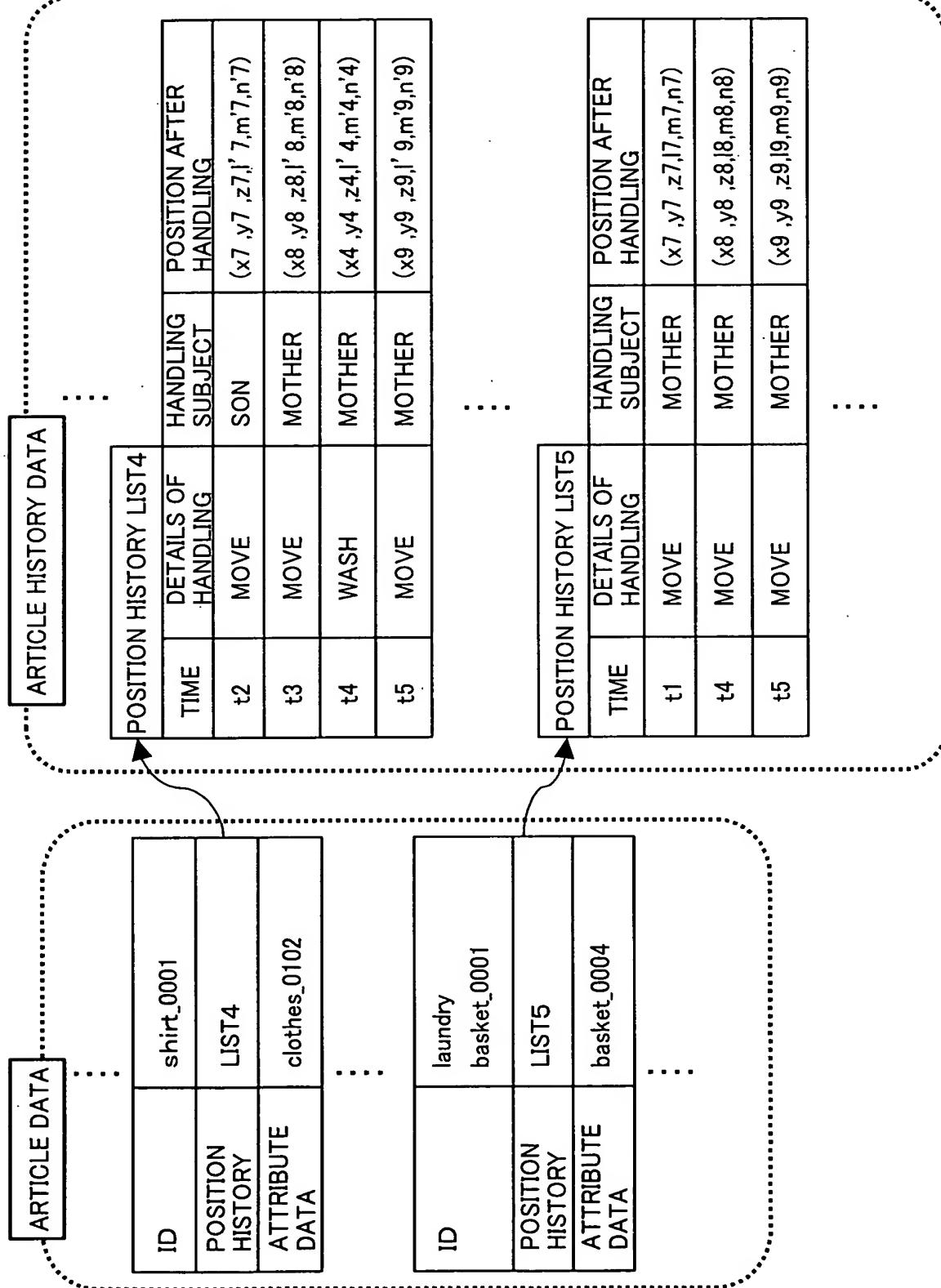
FIG.13

ARTICLE DATA	
ID	diary_0001
POSITION HISTORY	LIST3
ATTRIBUTE DATA	Book_0002
HANDLING RIGHT	DAUGHTER
TIDY POSITION	(x2,y2,z2,l2,m2,n2)
TIDY STATE	Door_key_0004 Lock

FIG.14

ARTICLE DATA		
ID	shirt_0001	
POSITION HISTORY	LIST4	
ATTRIBUTE DATA	clothes_0102	
ARTICLE STATE (PLACE)	SON'S ROOM	DRESSING ROOM
HANDLING RIGHT	SON	ALL
TIDY POSITION	IN DRAWERS	LAUNDRY BASKET
TIDY STATE	FOLDED	-

FIG. 15



15/16

## FIG.16

ARTICLE DATA	
ID	shirt_0001
POSITION HISTORY	LIST4
ATTRIBUTE DATA	clothes_0102
PLACE OF ARTICLE	
SON'S ROOM	DRESSING ROOM
VICINITY STATE OF ARTICLE	
-	NO PERSON
SOME PERSON	
HANDLING RIGHT	
SON	ALL
	PERSON IN VICINITY
TIDY POSITION	
IN DRAWERS	LAUNDRY BASKET
	LAUNDRY BASKET
TIDY STATE	
FOLDED	-
	-

16/16

FIG.17

ARTICLE HISTORY DATA			
POSITION HISTORY LIST4			
TIME	DETAILS OF HANDLING	HANDLING SUBJECT	POSITION AFTER HANDLING
t1	WASH	MOTHER	(x4 ,y4 ,z4 ,l4,m4,n4)
t2	MOVE	MOTHER	(x3 ,y3 ,z3,l3,m3,n3)
t3	TAKE OUT	SON	(x6 ,y6 ,z6,l6,m6,n6)
t4	BRING IN	SON	(x6 ,y6 ,z6,l6,m6,n6)
t5	MOVE	SON	(x5 ,y5 ,z5,l5,m5,n5)

FIG.18

ARTICLE HISTORY DATA			
POSITION HISTORY LIST4			
TIME	DETAILS OF HANDLING	HANDLING SUBJECT	POSITION AFTER HANDLING
t11	WASH	MOTHER	(x4 ,y4 ,z4 ,l4,m4,n4)
t12	MOVE	MOTHER	(x3 ,y3 ,z3,l3,m3,n3)
t13	MOVE	SON	(x5 ,y5 ,z5,l5,m5,n5)